

MODIFIED TRANSFER FUNCTION DEPOSITION BAFFLES
AND HIGH DENSITY PLASMA IGNITION THEREWITH
IN SEMICONDUCTOR PROCESSING

Abstract of the Disclosure:

An improved deposition baffle, that is provided to protect a dielectric window from conductive deposits, is provided in high-density-plasma apparatus having slots with features therein which spatially distribute the transmitted RF power density through a baffle. The features form connections and current
5 paths across the slot boundaries on the side of the baffle that faces the plasma, away from the window through which a coil couples RF power, thereby minimizing interference with the inductive coupling. In one embodiment, bridges across the slots on the plasma side of the baffle improve the flux distribution through the baffle. In another embodiment, blades in and parallel to the slots, on
10 the coil side of the baffle but which are supported by connections on the plasma side of the baffle, reduce the formation of plasma in the slots and prevents resputtering of material from the slot boundaries. In a plasma source with a deposition baffle, plasma is ignited at low power levels within a wide pressure range up to 20 mTorr with a combination of RF power of at least 300 watts, but
15 less than 600 watts, and the ramping of DC power on a target or other electrode from 0 watts to up to a level of not more than approximately 20 watts over a period of several seconds.